

# **APPLICATION FOR UNITED STATES PATENT**

**Inventor(s):** Holger Söring  
Jörg Söring

**Invention:** MEDICAL TREATMENT APPARATUS

**Attorney's Docket Number:** SOR204SP

Horst M. Kasper, their attorney  
13 Forest Drive, Warren, N.J. 07059  
Tel. (908)526 1717; Reg. No. 28559  
Attorney's Docket No.: SOR204SP

## **SPECIFICATION**

## Medical treatment apparatus

Preferably apparatus is employed which uses the advantages of ultrasound technology, for example the piezoceramic principle or the magneto-strictive principle, in connection with the employment of such apparatus, for example for cutting and for treatment of wounds. Here preferably the piezoceramic principle is employed since this piezo ceramic principle generates much less heat as compared with the magnetostrictive principle.

Bad smelling and damaging fume gases can be generated in connection with the use of such apparatus, which fume gases can interfere with the sight of the operator and can lead to an endangerment of the health by the release of damaging aerosols, toxic gases and human viruses.

Fume suction devices are installed in most operating theaters, wherein the fume suction devices suck out the field of operation in the large area through a central ventilation device. Such sucking off did not prove itself such

that today predominantly small apparatus is employed, which small apparatus is operated by an assistant. Here the so-called suction funnel is held by hand in the neighborhood of the operating tool, such that vapors and fume gases generated during the thermal tissue coagulation and during electro-surgical cutting can be sucked off immediately at the field of generation. In addition the aerosols released during the bactericidal treatment of wounds are sucked off with the aid of such apparatus.

It is a disadvantage of this method that the suck off apparatus has to be held by an auxiliary person, wherein the auxiliary person then is not available for other activities.

It is an object of the invention to generate a medical treatment apparatus in particular for the treatment of wounds, which medical treatment apparatus does not exhibit the above described disadvantage, however can be employed with the same effectiveness.

This object is accomplished by sliding an adaptation sleeve over the sonotrode of the medical treatment apparatus and by attaching the adaptation sleeve at the hand piece, wherein the adaptation sleeve is furnished with a connector for receiving a suction hose.

Particular embodiments of the apparatus can be taken from the sub claims.

The feed region of the sonotrode is covered with a sleeve screwed on the front region of the hand piece in a usual ultrasound apparatus, in particular for the bactericidal treatment or for the debridement of wounds. This sleeve can of course also be plugged or can be connected by way of a clamping cone or by a bayonet catch. After removal of the sleeve then the adapter part is set onto the hand piece and screwed on with a thread.

This adapter part is furnished with a receiver part for a suction hose, wherein the suction hose in turn is connected with a separating and depositing device. A further hose leads from this separating and depositing device to the

suction device. The apparatus "Atmo-Safe" produced and distributed by the company Atmos has proven to be a particular effectively working suction apparatus. The field installed in this apparatus is tuned to such a fine degree that the smallest components up to the size of viruses can be filtered out.

The treatment apparatus according to the present invention is now to be illustrated by way of an embodiment shown in the drawings.

There is shown in:

Figure 1 a side elevational view of a usual hand piece with an inserted sonotrode;

Figure 2 the hand piece with a screwed off sleeve;

Figure 3 a separate arrangement of hand piece and adaptation part;

Figure 4 a side elevational view of a hand piece with a screwed on adaptation device;

Figure 5 a complete set up of a suctioning device.

The medical treatment apparatus the illustrated in figure 1 comprises a hand piece (1) with a connector (5) for the connection line not illustrated to the storage container for flushing liquid such as rock salt solution and others and also medical healing agents such as heparin, antibiotics and the like, wherein the flushing liquid and the medical healing agents are then fed to the tip of the sonotrode through the flushing line (6) and the valve (7) and through a channel not illustrated here within the sonotrode (3). The ultrasound energy is fed to the hand piece through the electro-connection (4) in a conventional way.

The hand piece is further equipped with a sonotrode receiver, wherein a sonotrode (3) is exchangeably screwed into the sonotrode receiver. The attachment region of the sonotrode is covered with a sleeve (2), wherein the

sleeve can be removed with an attachment thread. Preferably, the sleeve (2) with its attachment thread is screwed into the thread (8) of the hand piece (1).

The adapter part can be attached to the hand piece (1) by way of the attachment thread (9) after the screwing off and the removal of the sleeve (2). This adapter part comprises a connection bush (9), wherein the connection bush (9) transitions into the adaptation sleeve (10). The receiver part (12) with the hose connection (13) is disposed at this adaptation sleeve (10) and the suction tube (11) is attached at the oppositely disposed end.

The hose (14) is inserted into the hose connection (13), wherein the hose (14) then ends in the separator (15). This separator (15) filters the large aerosol components out in a first step. This can be liquids or also solid components. Such separator (15) is primarily employed to care for the main filter disposed in the suction apparatus (A). The separator (15) can here be a conventional water trap or a HEPA-filter. Such a suction apparatus (A) is for example offered and distributed by the company Atmos under the Trademark AtmoSafe.

The suction tube (11) attached at the adaptation sleeve (10) can be produced out of a transparent plastic in order to improve the viewability for the medical doctor onto the treatment field. The separator (15) is connected to the suction apparatus (A) through the connection tube (16) and through the connector (17).

List of references numerals:

A suction apparatus

1 hand piece

2 sleeve

3 sonotrode

4 electro-connection



5 connection for flushing liquid

6 flushing line

7 valve

8 thread

9 connection bush

10 adaption sleeve

11 suction tube

12 receiver part

13 hose connection

14 hose

15 separator

16 connection hose

17 connector at apparatus